

**YOUR  
SPECTRUM  
SUPPLEMENT**

# QL USER



*QL User is a new magazine devoted to the Sinclair QL. It will appear as a supplement to every issue of Your Spectrum, until later this year when it will be published independently. Once the QL is firmly established, we'll let you know all the details — watch these pages for further developments. Meanwhile, our thanks go to all at Sinclair Research, without whose total co-operation this pilot issue would not have been possible.*

# Sir Clive makes the Quantum Leap



**Leapfrogging the opposition, Sir Clive's new micro looks set to crack the business computer market wide open. Innovative, stylish and powerful — and that was just the press conference! Sue Denham was there to bring you a blow-by-blow account of the excitement as Sinclair Research ceremonially unveiled its latest creation.**

Amidst a Hollywood-style 'turning 'em away' launch at the Intercontinental Hotel on January 12th, the world's technical press gathered en masse to see their favourite 'Mr Success' unveil his latest creation. To the whirring of video cameras and the clicking of cameras, Sir Clive with MD Nigel Searle took to the stage to announce the coming of the Sinclair QL.

As most must now know, the initials QL stand (modestly) for Quantum Leap and, as if to drive home the point, Searle emphasised that the new device was in no way a competitor to the ZX Spectrum. Described as a 'business machine, but not in the traditional sense', the QL is being pitched towards the advanced home user, the professional and the university student. And priced as it is at £399, the QL could very easily do for the business market what the ZX81 and Spectrum did for home computing.

As might be expected from a development project that lasted nigh on 14 months and ate into the best

part of £2 million, the QL is tastefully designed with the word 'Sinclair' moulded into the top — a good start towards guaranteeing success in the market. The unit itself measures in at a handy 138mm by 46mm by 472mm and tips the scales at 1388 grams (or just over 3lbs for those of you who have managed to resist going decimal). Built into the unit is a full QWERTY keyboard with 65 keys, including a space-bar, five function keys and four separate cursor control keys. And for those preferring to work with an angled keyboard, the entire device can be tilted using detachable feet.

## IT'S THE BUSINESS

Moving to the inside, the QL contains two processors and two custom-built chips. All the main processing is achieved with a 68008, the 32-bit microprocessor so highly favoured by more expensive computers. Alongside this is an Intel 8049, used to control such mundane tasks as the keyboard, sound and RS232C receiver functions. The two custom chips were designed by Sinclair Research; one takes charge of the display and memory, and the other controls the Microdrives, the real-time clock, the local area network (LAN) and the RS232C transmission.

As far as memory is concerned, Sinclair Research's new machine delivers the goods with 128K of internal RAM. And if that's not enough for you, a RAM expansion board will be available to expand this up to 540K. The QL's 32K ROM contains a single-user, multi-tasking, time-sliced operating system called QDOS, which has been custom designed for the new machine and makes full use of the command language, Sinclair SuperBasic.

And while on the subject of SuperBasic, Nigel Searle asserted that "It puts right all the things wrong with Basic. Indeed, it's so different

"When we introduced the Spectrum, we didn't know what we would do next. And now we've launched the QL, we don't know what direction this machine will take us..."



that it's deserving of a new name". However, it still includes the 'Basic' tag, if only to prevent users being put off at the thought of having to get to grips with a new language. But that said, it's claimed that anyone proficient in Sinclair Basic should have no problem finding their way round SuperBasic; and the fact that the new language is fully procedure structured, extendable, and its execution speed is independent of program size, certainly seems to make the effort worthwhile.

Although it was rumoured that the QL would contain 3½-inch floppy disk, Sir Clive in fact has plumped for an upgraded ZX Microdrive as the means of creating extra storage for the device. The QL Microdrives are not compatible with their forebears, and have increased capacity (to 100K) and a faster data-transfer rate than their ZX counterparts. The QL contains two such devices internally, with the option of connecting a further six.



The QL's keyboard incorporates many impressive features — including the ability to type on it!





The QL also has a slot to accept a QL ROM cartridge (again not compatible with the Spectrum equivalent) which, as time goes by, will no doubt offer access for programs written for the machine.

An array of ports can be seen at the back of the device and these include two joystick ports, two RS232C interfaces (allowing modems and professional printers to be added), a TV port, and a monitor port which provides two modes of resolution: 512 by 256 pixels and 256 by 256 pixels. There's also a high-speed communication link called QLAN, which can cater for up to 64 QL and Spectrum micros — passing data over the network at a rate of 100K baud.

Any comments you may have at this stage as regards options missing from the QL package may well have been foreseen by Sinclair Research. Enhancements already under development by the company for the QL include a C compiler, a 68000 assembler, a terminal emulator, an

A/D converter, a hard disk interface, a modem, a parallel printer interface and an IEEE-488 interface. And in addition to this impressive list, Nigel Searle announced that, "There are plans for a professional printer", and also that, "there will certainly be a version of Prolog for the QL".

#### THE SOFT OPTION

Backing up the machine with suitable software is a problem that's been taken quite seriously and Sinclair Research — together with Psion — produced four software packages to accompany the QL package, all inclusive within the asking price. Developed over 18 months, the software covers the areas of wordprocessing, spreadsheets, database management and business graphics. These are traditional business packages and as David Potter (managing director of Psion Ltd) demonstrated, the packages are extremely versatile and easy to use.

Indeed, Nigel Searle commented that, "in just three minutes, the first-time user would be able to use these packages". It's claimed in the accompanying literature that as the suite of programs was designed as an integrated package, learn the ins and outs of one and you'll learn them all!

The QL package is accompanied by a manual of massive proportions that contains a description of the machine, a guide to Sinclair SuperBasic, a SuperBasic reference manual and an examination of the four Psion software packages.

For further back-up, Sinclair Research has formed the QL Users Bureau (QLUB — geddit?). Parting with your annual subscription of £25 will entitle you lucky members to six newsletters and one free update to each of the four Psion software packages.

#### JOKING APART

Despite the importance of the occasion, Sir Clive was unable to resist drawing the inevitable comparisons between the QL and various micros already available on the market. With a wistful smile, he happily announced that to get an equivalent machine using the BBC 'B' as a base you would have to spend £1,800; for the Apple IIe — £2,150; for the ACT Apricot — £2,270; and for the IBM PC — £2,670. Even though Sir Clive himself proclaimed the exercise to be virtually meaningless, he went on to say that Commodore's new computer would be "miles away" from the QL and Apple's Macintosh would be "less performance at four times the price".

It will come as no surprise to the dedicated Sinclaphile that the QL will be available to begin with as a mail order item only. Priced at £399, you'll have to include a further £7.95 to cover postage and packing, and deliveries are promised within 28 days of the receipt of the order. Those eager to join the queue or make further enquiries should either phone 0276 686100 or write to Sinclair Research Ltd at FREEPOST, Camberley, Surrey GU15 3BR. High street retail outlets will be used to market the QL later in the year, and support for this is expected from the manufacturers of the machine, Thorn-EMI, who expect to be ramping up their production to 20,000 units by the summer of this year.

When asked about the future involvement of Sinclair Research in the micro field, Sir Clive proclaimed, "When we introduced the Spectrum, we didn't know what we would do next. And now we've launched the QL, we don't know in what direction this machine will take us."

All you can be sure of is that wherever Sinclair Research goes, a very large aftermarket of assorted suppliers is bound to follow. □



# On Balance

*QL may not stand for Curate's Egg, but whatever the 'media-speak' surrounding Sir Clive's professional offering, naturally the new machine has its pros and cons. Quentin Lowe gives us some first impressions.*

## The Pros

### Professional keyboard

Like many of the cheap machines these days, the QL's keyboard is based on a membrane system — in some ways a glorified version of the one we eye dubiously on the Spectrum. Yet when I tried it, it felt nothing like it! The keys are solid and have full travel, making it easy to type quickly and accurately. The membrane system is also, of course, a great protector against the likes of fag ash and coffee.

The keyboard comes well equipped with a total of 65 keys, providing access to a full ASCII set. This includes characters such as  $\{$ ,  $\}$  and  $\backslash$ , which may seem unusual now, but will ultimately prove essential when Sinclair Research implements its version of the C programming language on the QL.

### Memory

The biggest advantage of the 68008 chip is memory. The QL starts with 128K, and Sinclair Research has promised expansions of up to half a megabyte — 512K. Lots of memory is a good substitute for fast mass storage. Although the QL Microdrives are relatively slow compared to floppies, it will be possible to switch your QL on and read a big program and all its data into memory, all with access times way ahead of many CP/M business machines with their swaggy offering of 64K RAM.

### Not so Basic

The QL comes with the modestly-named SuperBasic — a brand new programming language that has little to do with previous Sinclair Basics. In fact, it's got very little to do with Basic (as we know it) at all — and, if truth be told, the name is probably only there so that newcomers will recognise it as a programming language. Still, it does have such traditional statements as GO TO and GO SUB, so it won't be impossible to convert existing Basic programs for the QL.

It's a heavily structured language with named procedures and functions. It handles a unique range of numbers, from  $-10^{-10}$  to  $10^{10}$  with an effectively unlimited number of significant figures. Strings can be up to 32K long, and Sinclair Research

even claims that the language will have facilities for multi-tasking, allowing you to run several processes at the same time. In keeping with the quality keyboard, Sinclair Research has dropped the keyword system altogether. Only time will tell if SuperBasic is as good as it looks,

### The free software

The QL comes with four of the most popular business applications packages for micros. There's a word processor, a database, a spreadsheet and a business graphics package. This is the first time that any home computer has been sold with its own set of serious 'built-in' software. The applications are written by Psion (as in *Yn-file* and so on) and if first glances are anything to go by, the packages are likely to be very well received indeed. They are not your run-of-the-mill home-based software, but serious business packages in their own right.

Psion claims the spreadsheet QL Abacus has most of the features and speed of Microsoft Multiplan — the top-selling spreadsheet from the CP/M and MS-DOS world. Similarly, the database QL Archive offers facilities previously unavailable on home machines. It's programmable, so not only do you drive it step-by-step from the keyboard using a handful of simple commands, but you can also write programs in its own built-in language. In this way, you can evolve a database using special customised commands and facilities, and whole complex operations (such as making a calculation on each entry in the database) can be made at a single command.

The wordprocessor QL Quill is very fast and offers a full range of formatting facilities. This lets you see justified text and page breaks on the screen — exactly as it will be when printed. Even underlining actually appears below the words underlined! And a real luxury — there's a continuous word-count on the screen that's kept up-to-date as you type.

Psion has not only achieved very capable programs, it's made them very easy to use. The programs carefully lead the user through each operation, showing what's been done so far, what's happening on-screen and just what can be accomplished if you stick at it. And just like any modern business package, there's a Help key that provides a short manual on-screen whenever you need it. By

using a special 'prompt panel' at the top of each screen, Psion has made it so that you almost don't need a manual! The programs would do well on any computer — even as CP/M or MS-DOS programs.

### Communications

The QL's interfacing allows it to be connected to most peripherals. It should be no trouble to get the QL to talk to Prestel and Micronet, or any other telephone service you care to name. In fact, with its proper keyboard, 80 column display and twin Microdrives, the QL is actually good value just as a data terminal for business use. The question is, who will be the first to write the software to do it?

## The Ins and Outs

Two built-in QL Microdrives, each with a capacity of 100K and an average access time of 3.5 seconds. Two slots are provided on the front of the device allowing the QL Microdrive cartridges to be inserted.

An extension slot allowing up to six further QL Microdrives to be attached to the system.

Two slots available for QLAN, providing the potential for a communications link for up to 64 QL and Zx Spectrum computers. Data is passed over the network at 100K baud.

A reset button, which enables the computer to be cleared without the need to 'pull the plug'.

The slot 1 power cable.



## The Cons

### The 32-bit chip

Well, actually it isn't. The QL uses a 68008, which is a special version of Motorola's popular 16-bit 68000 processor. The 68008 is mostly 16-bit inside but has the ability to operate on 32-bit words. As far as the outside world goes, however, it is an 8-bit chip — so what you actually call it depends on your own preference. (The same problem arose when IBM and Sirius used an 8088 in their machines rather than the 'true' 16-bit 8086 that now turns up in many of the newer machines.)

But anyway, setting aside the arguments, let's consider the advantages

of the 68008. It's fast, allows you to use lots of memory directly and is software-compatible with its big brother, the 68000. If you're into machine code, the 68000 has a super instruction set and is much easier to learn than chips from Intel's 8086 family.

In short, who cares how many 'bits' it's got?

### No Centronics port

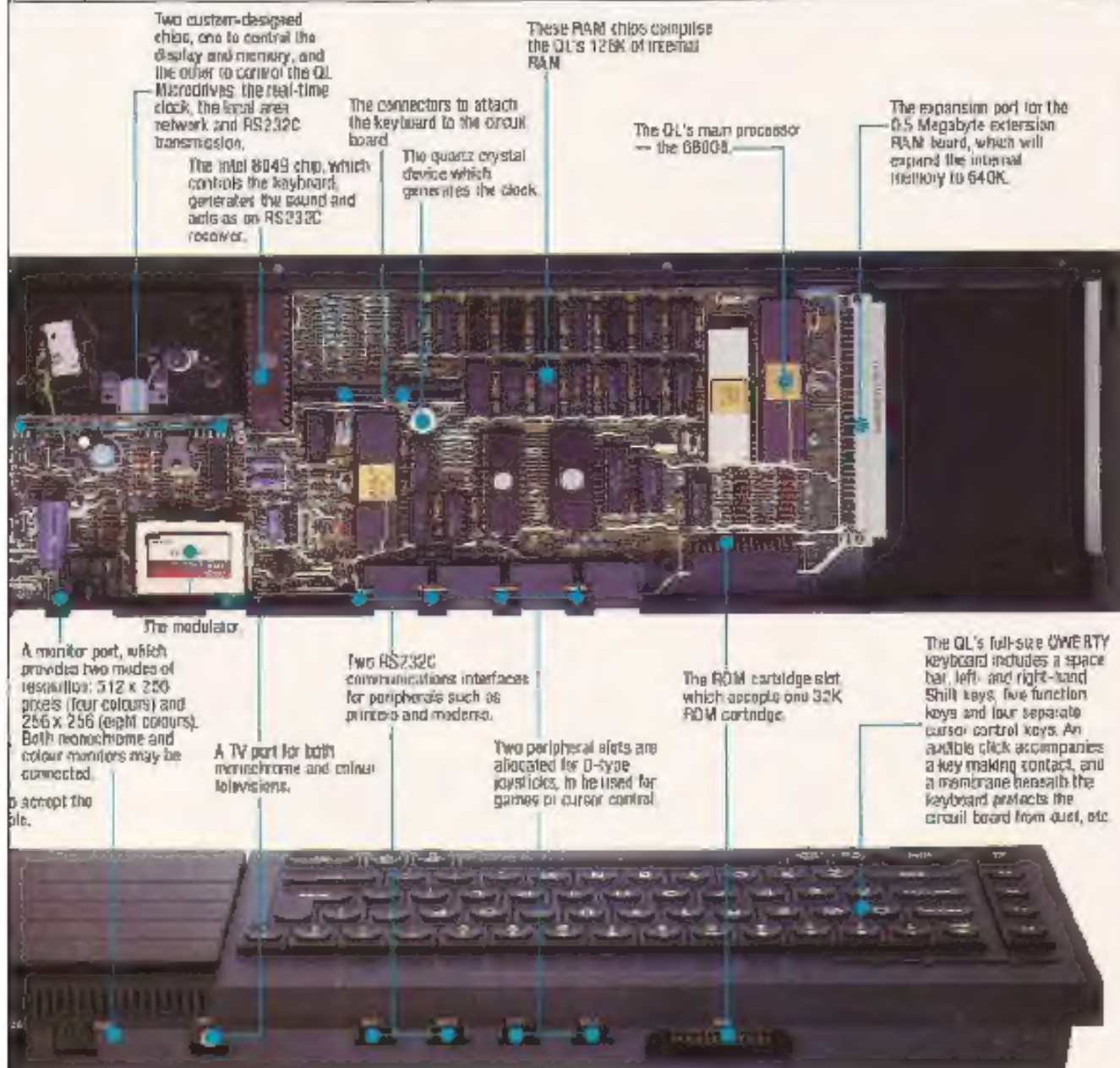
Even the One's got one of these! A Centronics parallel port would allow you to plug many professional printers straight in to the back of the QL, using a standard lead. Most popular printers (Epsons, Stars, etc) have Centronics interfaces as standard and you may have to pay

extra to get an RS232 version. The other problem with using RS232 for printers is that you need to mess around setting baud rates and so on, and may even need a special cable made up with the appropriate plug and wiring for the printer.

Sinclair Research is, of course, working on an add-on Centronics port. But although Spectrum users are quite used to any number of extra boxes plugged (and often Sellotaped) together, your average QL buyer is going to find the bits and pieces cascading out of the back of the new machine a bit of a pain.

### No disks

It surprised a lot of people to find Microdrives on the QL, even though



Two custom-designed chips, one to control the display and memory, and the other to control the QL Microdrives, the real-time clock, the local area network and RS232C transmission.

The Intel 8049 chip, which controls the keyboard, generates the sound and acts as an RS232C receiver.

The connectors to attach the keyboard to the circuit board.

The quartz crystal device which generates the clock.

These RAM chips comprise the QL's 128K of internal RAM.

The QL's main processor — the 68008.

The expansion port for the 0.5 Megabyte extension RAM board, which will expand the internal memory to 640K.

The modulator.

A monitor port, which provides two modes of resolution: 512 x 256 pixels (four colours) and 256 x 256 (eight colours). Both monochrome and colour monitors may be connected.

A TV port for both monochrome and colour televisions.

Two RS232C communications interfaces for peripherals such as printers and modems.

Two peripheral slots are allocated for D-type joysticks, to be used for games or cursor control.

The ROM cartridge slot, which accepts one 32K ROM cartridge.

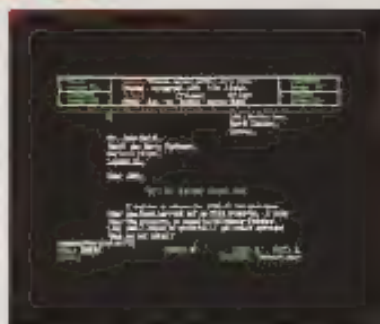
The QL's full-size QWERTY keyboard includes a space bar, left- and right-hand Shift keys, five function keys and four separate cursor control keys. An audible click accompanies a key making contact, and a membrane beneath the keyboard protects the circuit board from dust, etc.



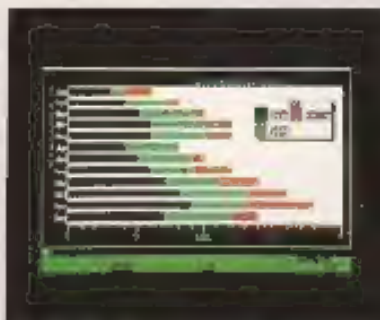
# The QL Software



This spreadsheet allows the use of the existing text rather than a complex system of numbers and letters as a reference for the manipulation of whole rows, columns or individual cells. There are also a number of built-in functions which allow the user to join worksheets together, use multiple windows, vary the widths and justify text, use different units, including monetary, integer, percentage, decimal and exponential formats, and input data as part of the worksheet. The package is self-documented, and has a comprehensive 'Help' facility should you find yourself in difficulties. Claimed to be an 'intelligent' worksheet, **QL Alchemy** always prompts with the most likely parameters you'll need for the job and through on-screen navigation, guides the user on how best to enter the data.



Incorporating a comprehensive command and control on-screen, **QL Quill** is fully interactive with real-time margin variation, page formatting, justification, etc. so it's a case of what you see on the screen is what you get and up with on the page. Many standard wordprocessing features are included, as well as new commands such as View, which allow overall checking of a wide document; and Glossary, which saves or recalls text.



This is an interactive package leading the user straight into graph creation without having to format the display before entering the data. Thus, the program can automatically design and scale the display to suit the parameters of the information input. There are eight pre-set formats (which can be called with a single key-stroke), allowing the innovation of stacked bars, overlaid bars plus line graphs, and pie charts — shading and use of colour can be employed to highlight the displays. Text can be input anywhere on-screen using cross-wires for positioning. The package is also capable of receiving data from **QL Alchemy** and **QL Archiver**, or sending graphics to **QL Quill** for inclusion in a written document.



This database package is a language-based filing system utilising some 60 commands to allow you to make use of flexible searching, selecting and matching facilities to retrieve data from any angle. Fields and records can be defined with variable lengths, displayed in any format and output to a printer in a specified style. It is also possible to export data from **QL Alchemy** or export data back to **QL Alchemy**, or on to **QL Quill** and **QL Email**.

## Sinclair's Specification for the QL

**SCREEN**  
136 x 46 x 472mm (5 3/4" x 1 3/4" x 19 1/2")

**PROCESSOR**  
132000 (3.055MHz)

**MEMORY**  
512K including VAT

**DISPLAY**  
128K, 32K of which is used for the screen bit map (Expandable externally to 640K)

**SOFTWARE**  
QPK, and contains Sinclair SuperBasic and the Sinclair 4006 operating system. (Expandable via a ROM cartridge to 64K.)

**PROCESSOR**  
Motorola 68008 (running at 7.5MHz) for all principal functions. (Architecturally, the 68008 to a 32-bit processor with an eight-bit data bus. One megabyte of non-segmented address space is available)

**OPERATING SYSTEM**  
QDOS (developed by Sinclair Research) features: single user multiple tasking; time sliced priority job scheduling; display handling for multiple screen windows; and device-independent input/output

**SOFTWARE**  
Sinclair SuperBasic, with the advantages of:

procedure structuring, extensibility (including syntax); interpretation speed independent of program size; clean machine code interface; operating system facilities accessible from SuperBasic; equal capability for strings and arrays; full-screen Basic editor; and full error-handling facilities

**GRAPHICS**  
high resolution graphics capability with colour or monochrome monitor (or TV) in two modes — 512 x 256 pixels (four colours available) and 256 x 256 pixels (eight colours available). Normal character display format of up to 35 x 25 with choice of character sets available (TV format of up to 45 to 60 columns depending on the software)

**KEYBOARD**  
Full-size, 65-key QWERTY keyboard featuring a space bar, left- and right-hand Shift keys, five function keys and four cursor control keys.

**DISK DRIVE**  
The QL incorporates two QL Microdrives, each with a minimum 100K capacity. 3.5 seconds average access time, and loading of programs or data into internal RAM at up to 15K per second.

**POWER**  
20 DC at 1.8A.  
15.0V AC at 0.2A.

Excluding RGB monitor, power sockets and TV port, nine peripheral/expansion ports are provided — internal expansion (1), Microdrive expansion (1), ROM cartridge (1), serial (2), local area network (2)

**EXPANSION**  
One megabyte of address space is available for expansion.

**DISK DRIVE**  
A further six QL Microdrives can be attached. Four blank cartridges are supplied with each QL.

**ROM CARTRIDGE**  
One QL ROM cartridge at up to 32K can be accepted

**COMMUNICATIONS**  
Two standard RS232C communications interfaces for printers, modems, etc. Transmission at rates from 75-19200 baud or full duplex transmit/receive at seven rates up to 5600 baud.

**NETWORKING**  
For up to 64 QL or Spectrum computers, data transmission over the net can be achieved at 100K baud.

**PERIPHERALS**  
Provision for one or two devices for games or cursor control.



they upgrade their ZX equivalents. They are an obvious cost-cut, but relative to the rest of the machine they slow the whole show down. The QL will never run an existing 68000 DOS such as a UNIX, or the newer CP/M-68K, while stuck with Microdrives. And, at present, there's also no way of adding floppies—even if you don't mind paying another £300 for the privilege.

Sinclair Research is thinking about a hard disk for the QL that would give it the potential to run UNIX, but it still seems a silly thing to do without first investigating the use of floppies. How do you back it up? A 5Mb Winchester is 5000K of data and there's 100K on each Microdrive. That's um... 50 cartridges to back up the whole disk!

#### It's a colour machine

The QL may only have four colours in its normal operating mode, but it's obvious that you're supposed to use it with a colour screen. There isn't even a socket to connect a black-and-white monitor, although you could use it with a black and white TV. The only problem is that a lot of users may find it hard to distinguish between red and green on a black-and-white screen. This is not to say you can't do it, just that you'll probably be better off with colour.

#### Locked in its own architecture

This isn't the sort of phrase you hear very often down the home end of the market—because more or less every home computer is. It simply means that the computer uses its own Basic and DOS, and can't swap programs and add-ons with other machines. In the business world this can count for everything. Manufacturers ensure that there is software for their machine by making it to a specific standard—either CP/M or IBM compatible, or whatever. Non-standard machines often give up in the end and bow down to the industry standards.

Sinclair Research doesn't really care. The only way it can continue to offer shockingly innovative products is by behaving in a non-standard fashion. And the products are invariably successful enough to carry this off. There's no doubt that the QL will be a popular target for new add-ons and software, and that a million existing "Sinclair people" will want to move on to a QL. Going his own way has never stopped Uncle Clive and never will. In fact, it's quite surprising that other micro manufacturers haven't started to copy him and offer Spectrum compatibles.

Besides, the C language will do the QL a lot of favours in this respect. It's very portable and many major software houses are now using it for all their work. So, you can expect all kinds of programs—from CP/M machines up to xterminals—to find their way onto the QL. □

# Kewneat Emptor

*If you want to be first in the queue for a QL, hear what the scourge of the personal computer world, Guy Kewney, has to say.*

For those who like something to worry about, here's a suggestion—worry about when your QL will be ready.

There is a picture of the QL and its circuit board in the advertising brochure. We thought that looked like a nice picture, but decided we wanted our own. So we tried to get a QL to take photographs of. Guess what happened?

Our failure to get our hands on machine was enough to start our investigations into delivery dates. First, we found that Sinclair Research despatch people were quoting "Twenty-eight days" to anybody who asked when QLs would be available. It didn't matter when you asked, it was always 28 days. So, we interrogated further and they said "It's 28 days from when you order—unless, of course, you ordered before January 20th. That's the earliest day from which it's 28 days; any orders before January 20th are taken as being orders placed on January 20th."

Spies who got into Psion (Sinclair Research's tame software house) tell us that the QLs they're using there are December vintage, and look like very early pre-production prototypes. And they don't have QDOS, the QL's multi-tasking operating software.

So, unless things have moved fast from the situation at the beginning of December, say our spies, the QLs are further away than we think. And the software, likewise, seems far from ready. With luck and help from all suppliers, it seems that we can look forward to seeing at least some QLs before April. But nobody in the business is really expecting to see hundreds before then.

And there is one other little bother . . . memory. The QL itself has 128K of memory, which sounds a lot, but already a lot of software writers are

muttering that they won't really be able to use all that multi-tasking ability until they have the extra half megabyte 'add-in' memory that Sinclair Research promises. And when is that likely to appear? At launch time, Sinclair Research didn't even know what it would cost, and could only offer "before the end of the year" as a release date.

But everybody in the silicon business knows that between now and the end of the year, memory chips are going to be scarce. Even if you offer to pay a premium price, they'll be scarce, because all the silicon foundries are fully stretched meeting orders already accepted. And when did Sinclair Research ever show any inclination to pay a premium price?

To summarise, therefore, if you order now, you can expect to be the possessor of a QL before May. If you try to order memory now, you will be fobbed off. If you simply have to have a 68000-based computer with a half megabyte, it seems likely that you'll have to forget about either a Sinclair QL or an Apple Macintosh until 1985, and spend a fortune on a Sage instead.

There is good news, however. In a secret deal with Barclaycard and Access, Sir Clive has arranged that the £400 price of a QL will not bust your credit limit. That is, if your credit limit is £500, and you buy a QL, your credit limit will still be £500. If it is £600 but you have already spent £400, you will be able to buy your QL, and still have a £200 limit left. Sir Clive and the credit card companies are keeping this a secret until April; naturally we are telling you now.

In other words, you now have a lead on rival customers who are saving up! Buy now, with plastic money, and beat the queues.



NICK DAVIES





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## Computer Graphics Language

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## TECHNICAL DETAILS

**TECHNICAL  
DETAILS:** SCOPE is a fully structured multi-task language specifically for writing graphics, animation and sound. Being fully compatible with BASIC it is ideal for writing both arcade and adventure style games. Additionally, with SCOPE present in high memory it can be used as an assembler with SCOPE words as plain language mnemonics. Therefore no knowledge of machine code is required. The language is extremely easy to comprehend and is very powerful indeed providing many features not available from BASIC.

## SCOPE HAS TO BE USED TO BE BELIEVED

## 40K SPECTRUM



and is very powerful  
dinding many features  
from BASIC.

**TO BE USED  
VED**

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